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<th><strong>MxD 16-03-01</strong></th>
<th>Category: PO to 1st Article, Recurring Manufacturing, Engineering Change</th>
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<tr>
<td><strong>Title:</strong></td>
<td>Automated CNC Process Planning Software: CNC-RP</td>
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<td><strong>Completion Date:</strong></td>
<td>2018-08-15</td>
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<td><strong>Project Team:</strong></td>
<td>Iowa State University, Deere and Company</td>
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| **Coordinator Contact:** | Matt Frank  
MFrank@iastate.edu                                                                 |
| **For Additional Information:** | If you are a member of MxD (formerly DMDII), go to https://portal.dmdii.org/.  
If you are not a member of MxD, contact Tyler Vizek (Tyler.Vizek@mxdusa.org). |

**Problem Statement:**
We lack a direct digital manufacturing method for short run, prototype or service parts made via CNC machining. Problem is that fixture, setup, tooling and NC code generation directly from a CAD model without significant skill and time is not possible. We cannot afford the hours or days it takes to prepare to machine one or a few parts.

**Deliverable:**
The key deliverable is a plug-in for a CAM package (in this work, MasterCAM).

**Summary:**
This solution allows for unskilled operation of a CAM package, resulting in CAD-to-NC code in minutes. The approach is akin to the “push-button” nature of Additive Manufacturing, but with CNC machining accuracy. CNC-RP is available as an installer, and will load the requisite libraries and definitions, instructions to create a toolbar in the CAM environment and setup/use of the software and machine.

**Industry Use Case:**
- CNC-RP would be an optional mode of operating both CAM and milling assets.
- When a short run, prototype, or service part is needed, the user will load a part model using the CNC-RP plug-in and interface.
- Resulting NC code and setup sheet will be used to create a part from prescribed round stock, between centers on the milling machine. When setup, and stock are available, a cycle start can be possible within one hour of CAD model receipt.
- The use case is a tradeoff between engineering planning and setup time for an extended lights-out machining cycle.